

A fuzzy logic approach to manage uncertainty and improve the prediction accuracy in student model design

ABSTRACT

The intelligent tutoring systems (ITSs) are special classes of e-learning systems developed using artificial intelligent (AI) techniques to provide adaptive and personalized tutoring based on the individuality of each student. For an intelligent tutoring system to provide an interactive and adaptive assistance to students, it is important that the system knows something about the current knowledge state of each student and what learning goal he/she is trying to achieve. In other words, the ITS needs to perform two important tasks, to investigate and find out what knowledge the student has and at the same time make a plan to identify what learning objective the student intends to achieve at the end of a learning session. Both of these processes are modeling tasks that involve high level of uncertainty especially in situations where students are made to follow different reasoning paths and are not allowed to express the outcome of those reasoning in an explicit manner. The main goal of this paper is to employ the use Fuzzy logic technique as an effective and sound computational intelligence formalism to handle reasoning under uncertainty which is one major issue of great concern in student model design.

Keyword: Intelligent tutoring systems; Fuzzy logic; Student model; Uncertainty